

Modern Assessment of Risky Drinking in College Students

An Honors Thesis (HONR 499)

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Abstract

This study examined the assessment of Risky Drinking in college students. The term Risky Drinking was operationally defined as unhealthy drinking habits that have social or physiological consequences that do not reach clinical levels defined by the DSM-IV. This study added items to the College Alcohol Problem Scale-Revised (CAPS-r) constructed by Dr. O'Hare in 1997 to measure Risky Drinking habits in undergraduate students. The original CAPS-r measurement was constructed almost 20 years ago and does not include modern behaviors such as texting, calling, or posting on social media while intoxicated. Three new items were added to the original eight items on the CAPS-r scale to measure technology-related behaviors. Participants responded to this modified scale, the Michigan Alcoholism Screening Test (MAST), and demographic information. I hypothesized that reliability (Cronbach's alpha) for the new scale with 11 items will remain consistent and not be significantly lower than the original scale. In addition, I hypothesized that the external validity might significantly increase with the addition of the three items. This revised scale could become a potential resource for college counseling centers and students to quickly identify problem behavior and seek resources if needed.

Keywords: alcohol, college students, assessment, risky drinking, alcohol abuse

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Process Analysis Statement

Throughout my undergraduate experience, I have been able to explore my passions within psychology with the help of mentors and advisors. This thesis allowed me to dive deeper into addictions in college students, revealing more about my peer group and challenges we face. When I first delved into the literature, topics surrounding high alcohol consumption such as the influence of Greek Life, sexual assault, depression, and anxiety brought even more questions than what I started with.

During my capstone project for the Women and Genders Studies program, my research enabled me to ask informed questions to people I job shadowed. Our Peer Victim Advocate gave me insight to the effects of elevated alcohol consumption in college campus sexual assault cases. This opened my eyes to the role alcohol can play in victim blaming. In addition to the Victim Advocate, I interviewed Amy Strasburger from the Indianapolis Veterans Affairs Center. A common theme in both sexual assault survivors and veterans was the tendency to self-medicate traumatic experiences with excessive alcohol use. Hearing the outcomes of self-medicating behaviors propelled my motivation to extend research on the College Alcohol Problems Scale and modern behaviors.

Inside the PSYS 499 Capstone classroom, I was able to develop skills in providing effective feedback, brainstorming novel ideas, and practiced reaching out to valuable resources for input. When we began giving feedback about thesis ideas and data collection, it was a challenge for me to feel as though my feedback was concise and useful to other students. Working collaboratively taught me how to look for areas to improve as well as strengths of other students to make meaningful feedback. The students in this class proved to be an excellent sounding board for new ideas and reinforced the importance of collaborative research and why a

team is so useful when tackling new challenges. I also found myself reaching out to professors, classmates, and peers to gain extra perspectives and allow my project to be professionally critiqued from multiple points of view throughout its development.

Something I learned about myself during the thesis process was my passion for applicable science. Through research, psychology professionals can create therapies that are more targeted toward the individual person's experience. One aspect that drew me to the CAPS-r measure was its ability to pinpoint types of problematic behavior as a result of excessive alcohol use. This measure could be a tool for counseling centers on college campuses for students to quickly and clearly assess if they are at risk. Boundaries that campus resources have experienced when reaching students have included shame or fear of face-to-face interaction and students' busy schedules. Creating an online, research-informed resource that takes less than 5 minutes to complete could be key to raising awareness of problematic drinking behaviors. Knowing that this research could lead to students having greater accessibility to preventative care made all of the hard work worth the stress.

This capstone thesis project has made my graduate school dreams a reality. By creating a project that represents my first step into research and treatment of addictions, my future mentor was able to see the passion and dedication I am willing to put into the field. I look forward to using this project as a platform for future research questions which will inform the next step of my career as a mental health counselor.

Modern Assessment of Risky Drinking in College Students

Problematic behavior related to alcohol has been an issue within college students for some time in the United States. Just under half of college students report binge drinking (defined as four or more drinks in a row) and one in seven college students report extreme binge drinking (defined as ten or more drinks in a row) (Johnston, O'Malley, Bachman, Schulenberg, & Patrick, 2013). In addition to these alarming rates, college seems to be the critical time when these drinking habits are formed. Johnston et al. (2013) found that college-bound students were less likely than non-college-bound peers to consume alcohol early on in middle school or high school. This raises the concern of researchers about the environmental influences of college campuses due to the overwhelming alcohol consumption after entry into college.

Current methods of assessment test multiple levels of problematic use of alcohol in college students will be reviewed. The CAPS-r measure (O'Hare, 1997) is a quick survey that can be completed in 10 minutes or less, is easily accessible to students, and covers various warning signs of problematic alcohol use. A factor analysis revealed two sub-scales on the CAPS-r of Socio-Emotional and Community Problems. These subscales enable professionals to adapt therapies to correct more specified behaviors than before.

This measure, however, leaves out modern red flags pertaining to technology. Past research points to impulsivity and poor decision making as consequences of alcohol consumption. The modern college student's social interaction is no longer limited to the people around them with the introduction of cell phones. Texting, posting on social media, and calling while intoxicated may be new indicators of problem drinking behaviors go untested in measures currently used.

This study addressed intoxicated calling, texting, and posting on social media by adding items that test communication via technology while intoxicated to the CAPS-r. Measures in these kinds of experimental designs should be up to date with applicable items that are easy and quick for students to respond to. Early intervention and prevention could be a major benefit of the current study. Behavioral interventions (particularly during the first year of college) have shown reduced alcohol consumption and resulting problems with alcohol (Scott-Sheldon, Carey, Elliott, Garey, & Carey, 2014). This new measure could promote early detection of problem drinking in college students and encourage awareness of the behaviors in the student and in any professional using the measurement as well. The primary benefits of the current study include increased awareness and extending current measurement of sub-clinical alcohol problems.

Literature Review

Defining Problematic Drinking Behavior

Problematic drinking in college students has been a topic of much research in recent years. With more students continuing to college from high school, the social environment is a focus of recent research. Many experience independences for the first time, exposing them to new opportunities such as college parties with alcohol present. In a 2008 study by Devos-Comby and Lange, three levels of issues pertaining to alcohol were defined. These levels include risky drinking, alcohol abuse, and alcohol dependence.

Risky Drinking. The term risky drinking is defined by Devos-Comby and Lange (2008) as problematic alcohol use that does not reach clinical levels of abuse or dependency. This subclinical group is important to current studies and prevention efforts especially in the college student population. Many habits are formed while in college, including social behaviors like drinking. Risky drinking can develop during this time, leaving college counseling centers with

the challenge of assessing and treating these individuals before they reach clinical levels of abuse and dependence. The current study aims to assess risky drinking level issues before they develop into more serious behaviors.

Alcohol Abuse. The Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM–IV–TR; American Psychiatric Association, 2000) defines alcohol abuse as “a 12-month period, characterized by one or more of the following recurring instances: failure to fulfill major role obligations at work, school, or home; physically hazardous situations; legal problems; or social/interpersonal problems” (American Psychiatric Association, 2000). Measurements specific to alcohol abuse focus mainly on the social implications and behaviors of the participant. Issues surrounding these types of measurements include self-awareness and bias of the individual due to environment. Items that assess the attitudes of other people toward the participant such as, “Have people annoyed you by criticizing your drinking?” could be affected by who the participant is around daily. If their peers share drinking behavior, they may answer no to this item because there is a shared problem drinking behavior, rather than answering no because there is not a drinking issue.

Alcohol Dependence. Alcohol dependence is defined by The American Psychiatric Association (2000) as meeting at least three of the prominent criteria outlined in the DSM-IV-TR. These criteria include tolerance, withdrawal symptoms, inability to stop consumption, significant time with alcohol and taking time away from other activities, as well as use despite knowledge of consequences (American Psychiatric Association, 2000). Components of alcohol dependence include more physiological markers due to changes in the body caused by chronic consumption. Although not these items are needed at one time in a single participant, measures

may test for all criteria and define a threshold number of confirmed symptoms to diagnose dependence.

To create an accurate picture of the problematic behavior exhibited by a participant, measures must be specific to the type of behavior they aim to identify. One measure might be great for identifying social issues that could point to alcohol abuse while lacking the ability to accurately diagnose the added physiological symptoms associated with alcohol dependence. In this review, major scales meant for clinical and non-clinical assessment measures used for college student populations will be examined based on their ability to accurately identify problem behaviors on all levels and the accessibility they have for students.

Measuring Drinking Behavior

Clinical Scales. Similar to other areas of psychological diagnostic criteria, the understanding of alcohol abuse, dependence, and related risky drinking behavior has changed over time. The initial effort to assess dependence made in the 1980's focused mostly on clinical populations (Devos-Comby & Lange, 2008). These measures were found accurate primarily for individuals who surpassed a diagnostic threshold. Currently, the focus has shifted toward prevention of behaviors that could lead to clinical diagnoses. The following measures have been found to be prominent in research, produced effective results, and have been widely used with college student populations.

MAST. The Michigan Alcoholism Screening Test (MAST) (Selzer, 1968) was the first widely used test to assess all three levels of alcohol related issues focused on in the current study (alcohol abuse, alcohol dependence, and risky drinking). It consists of 24 items with a user-friendly scoring system and definitive diagnostic guide, “the scoring system assigns points (0 – 4) to questions based on their ability to discriminate alcoholic and nonalcoholic respondents in

development samples”. Overall scores exceeding five points can diagnose alcohol dependence (Devos-Comby & Lange, 2008).

Although it has been widely cited, it was developed in the 1980’s, limiting it to the time it was created. The definition of alcohol dependence is not up to date with newer definitions and could pose problems with diagnosing based on old criteria. Svanum & McGrew (1995) confirmed this weakness of the MAST by testing a group of college students that included participants that met current requirements for alcohol dependence outlined by the DSM-IV-TR. According to the study, the test incorrectly identified 64% of the nondependent students as dependent on alcohol (Svanum & McGrew, 1995). Another concern with MAST is the ability to condense the test to cater to college students. Shortened MAST measures have proven to be less dependable than the original, longer version when issued to college students (svanum & McGrew, 1995). Given the need for quick and easy assessments for students that do not take time away from their busy schedules, MAST may not be the best fit for this testing setting (Devos-Comby & Lange, 2008).

SASSI Instruments. The Substance Abuse Subtle Screening Inventory (SASSI) is widely used to determine clinical levels of a long list of substances, including alcohol. The subtle screening tactic uses questions that do not directly ask the participant, “do you drink an excessive amount of alcohol” to assess alcohol consumption. Instead, this measure focuses on qualities of individuals likely to have substance abuse disorders (Miller, 2016). Several revised versions of this scale exist, the most current being the SASSI-3 which contains 67 items with nine subscales. Subscales address obvious and subtle attributes, defensiveness, an addiction measure, questions about the consequences of alcohol and drug use, symptoms, family and personal history with addiction, a correctional subscale and a scale to detect random responses (Lazowski, Miller,

Boye, & Miller, 1998). These items could be essential to targeting people with problem behavior that cannot self-identify.

CAGE. The CAGE questionnaire (Ewing, 1984) is an acronym to easily remember the four items it is composed of. These items include a physician asking about cutting drinking, annoyance with criticism of drinking habits, guilt related to drinking, and an eye-opening experience. In this case, eye-opening refers to the need to drink as soon as a person wakes up in the morning (Devos-Comby & Lange, 2008). This measure satisfies the need for a quick assessment that is accessible to clinicians. The length of the assessment (only 4 items) compared to others of its kind fits the college population well. As many researchers on college campuses have experienced, college students usually are not willing to take long surveys or assessment tools because their time is in such high demand. The CAGE questionnaire would be useful for this purpose. However, after validity and measurement assessment, the CAGE was not as effective in detecting the risky drinking behavior targeted in the current study. While it could test for abuse and dependency, the CAGE was less sensitive to non-clinical levels of problematic drinking habits (Fiellin, Reid, & O'Connor, 2000).

Svanum's Scale. In addition to the CAGE measure, Svanum's Scale (Svanum & McGrew, 1995) offers a short and easily accessed measure that students and clinicians could administer to themselves or others to self-assess drinking habits. Svanum's Scale is most widely used to determine alcohol abuse (defined in this study as drinking with mostly social consequence such as failure to fulfill work or academic duties). Only one item on this scale correlates with the DSM-IV-TR definition of dependence, making this scale ideal for college students who may be in the range of risky drinking and alcohol abuse since alcohol dependency comes with chronic use and physiological changes within the body that take time to develop. An

issue that could occur with this scale is the dichotomous nature of the responses to the items. A score of 1 positive answer or above is listed as being sign of alcohol dependence according to this measure, even if that score comes from the items that do not align with the dependency definition given in the DSM. This is harmful to differentiating the types of abuse that can happen, especially within college students since dependency is not as common in younger drinkers. (Devos-Comby & Lange, 2008)

Sub-Clinical Scales. Sub-Clinical scales assess problematic behavior related to alcohol that does not satisfy the requirements for Alcohol Abuse or Alcohol Dependency. These Sub-Clinical scales instead focus on risky drinking behaviors that could help detect problematic behavior before it turns into a clinical level diagnosis. Another benefit of a Sub-Clinical level scale is the ability to test efficacy for programming that aims to prevent or remedy risky drinking. Sub-Clinical scales could improve the experience of college student programs such as the one featured in a 2011 study by Reynolds, MacPherson, Tull, Baruch, & Lejuez. Reynolds et al. (2011) evaluated a Maryland orientation program in freshmen students across the first semester at three checkpoints and was found useful for targeting college programming (Reynolds et al., 2011).

RAPI. The Rutgers Alcohol Problem Index is a self-report measure consisting of 23 items which test the outcomes of drinking. Participants are asked to rate their experiences with the consequences from 0 (meaning never occurring) to 4 (meaning occurring 10 times or more). The RAPI has been widely used in college populations, testing the perceived consequences of participants' drinking habits (White & Labouvie, 1989). A strength of this scale is the non-dichotomous nature of the responses. By considering the number of times a consequence has happened to a participant, the scale lowers the number of normal behaviors labeled as

problematic due to one false positive answer (Armenta, 2018). In addition to this, the nature of consequence-based items gives a developmental perspective on alcohol related problems. In a study conducted by Neal, Corbin, and Fromme in 2006, researchers could determine differences in a sample of high school and college students based on RAPI results. This 2006 study found that high school students were more likely to experience negative consequences in their family relations and college students were more likely to experience negative academic consequences due to problematic drinking habits (Neal, et al., 2006). These results could help inform therapy settings based on the environmental differences between high school and college students.

A potential downfall with this scale is that participants may want to appear differently than they are or experience shame regarding their drinking. In addition to this, the RAPI was developed with a sample with many participants under the age of 15, making some consequences such as intoxicated driving and regretted sexual encounters less likely to apply to non-sexually active people and those without a license (Devos-Comby & Lange, 2008). If aiming to test a college population, scales should adhere to realistic scenarios for the intended audience to produce the most accurate information. A study by Borsari, Neal, Collins, & Carey in 2001 found discrepancies between major indicators of risky drinking in college students and results of the RAPI (Borsari et al., 2001). Binge drinking frequency and blood alcohol levels were not highly correlated to results on the RAPI, raising questions of the validity of the measure in relation to these variables. Infrequent episodes of binge drinking could alter results on this measure, further weakening the strength of results in this situation.

AUDIT. The World Health Organization used research from several countries to create an assessment that could be used across multiple cultures to detect problematic drinking. The goal of the Alcohol Use Disorder Identification Test is to test individuals before drinking

becomes problematic on clinical levels (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993, p. 793). Although the purpose was preventative testing, the AUDIT has been found to test for Alcohol Abuse and Dependency as well. This measure has been found accurate in detecting gender differences, resulting in different cutoff scores based on gender to detect problematic behaviors. This difference allows adaptability in the test depending on the participant (DeMartini & Carey, 2012). Since the AUDIT tests based on the lifetime of the participant, it does fail to test positive for recent drinkers (problematic drinking within the past year) (Devos-Comby & Lange, 2008). The current study would aim to test recent drinking history of the participant since college is such a short period of time when considering an entire lifetime of habit forming and sudden change in environment of the participant if they recently entered college.

YAAPST. The Young Adult Alcohol Problem Screening Test assesses drinking behavior based on 27 items with dichotomous yes/no items (Hurlbut & Sher, 1992). In this test, participants answer based on phases of life to decipher between recent and lifetime issues (a problem seen in the AUDIT results). Many studies have used the YAAPST in college samples, including those with large samples of mostly freshman college students. These studies found that, “90% of drinking students indicated that they had experienced at least one alcohol problem in the past year, which suggests that the YAAPST tapped relatively common consequences” (Devos-Comby & Lange, 2008). Although it could be viewed as helpful to have high sensitivity for common consequences, measures should be careful to not over-identify problematic drinking behavior to prevent unnecessary concern for college students that may exhibit normal drinking habits.

CAPS. The College Alcohol Problem Scale was originally created in 1997 with 20 items by evaluating crucial aspects of collegiate alcohol problems. Categories of problems included in

the original 20 items were psychophysiological, emotional, interpersonal, and community problems (O'Hare, 1997).

CAPS-r. Later on, this scale was revised to include only 8 items by Dr. O'Hare. This scale is the closest model to the current study's goal for a measurement in college students (O'Hare, 1997). The items are specific to college students' consequences of problematic drinking and is short enough to be attainable for college students to self-administer in a short amount of time. It can be scored by either a mental health professional to get a preliminary test on drinking behaviors before treatment or by the respondent to seek feedback about existing alcohol use (O'Hare, 1997). This measure was tested against the MAST for validity and was found to accurately identify participants with problematic drinking behavior. Since the CAPS and CAPS-r were designed over 20 years ago, the items are dated and do not include the consequences seen more recently in drunk phone calls or texts. This gap in research will serve as the basis for the current study, but with updates and additions that modernize the scale.

Intoxication and Cell Phone Use

Cell phone use, particularly texting and calling, while intoxicated has been recognized as a cultural phenomenon but rarely studied or used in measures for alcohol misuse. A recent study on texting and calling while drunk reveals correlations linking sexual behaviors and deficits in emotion regulation (Trub & Startks, 2017). This study also sites cell phone communication as a way for people to "regulate internal states or exert behavioral control, as suggested by findings that texting is motivated by inhibition reduction, diminishing of anxiety about expressing thoughts and feelings and managing relationship conflicts with greater ease" (p. 3). Intoxication offers an opportunity to interact with thoughts, feelings, and relationships without inhibition, sometimes to the disadvantage of the individual. Referencing the diagnostic criteria explained

earlier in this review, criteria to diagnose alcohol dependence and abuse included social and interpersonal problems. These interpersonal problems are now extended with the development of technology.

While it is difficult to tell so early on in research whether sexual and emotional regulating behaviors are precursors or results of dangerous alcohol consumption, these behaviors also appear in items on the College Alcohol Problems Scale (CAPS). This alignment suggests that adding items that test for calling, texting, and posting on social media could lead to a better picture of a person's interactions with others while intoxicated. The preliminary nature of Trubs & Starks (2017) study lends itself to further investigation and analysis of the link between technology use and alcohol misuse. The current study could propose an opportunity to draw further conclusions about the role of increasing communication via cell phone and rising rates of alcohol related issues in college students.

Current Study

Assessments for alcohol abuse, dependence, and risky drinking have offered several methods of gathering data and the analysis of these measures shows the need for an updated scale that has validity for sub-clinical levels of problematic alcohol use. The current study aimed to add modern items to the College Alcohol Problems Scale which was created in 1997 (O'Hare, 1997). This scale covers common problems associated with drinking including depression, anxiety, guilt, appetite, driving under the influence, unplanned sexual interactions, and illegal activities.

To create a fuller picture of behaviors of the participant, items relating to regretted texting or calling while intoxicated and making inappropriate social media posts while intoxicated are included. As stated by Trubs and Starks (2017), communication over technology

can provide a look into disinhibited behavior while intoxicated and links to other behaviors mentioned above such as unplanned sexual interactions and emotional regulation. The current study aims to modernize current assessment and make it more relevant to college age students with technology at their fingertips. To do this, the current study drafted and analyzed items that test the construct of impulsive and regretted social media posts and texting or calling in college students with risky drinking habits. While this scale will not diagnose alcohol abuse or dependence, it will paint a more inclusive picture and further the preliminary research on the link between technology and alcohol related difficulties.

I hypothesized that after testing reliability with Cronbach's alpha for the original 8 items of the CAPS-r (O'Hare, 1997) and the new scale with 11 items, there would be no significant decrease in internal reliability between these scales. In addition to this, I hypothesized there would not be significantly lower reliability scores using Cronbach's alpha when the new scale with added items was compared to the MAST measure and the external reliability would significantly increase with the addition of the three items. Overall, my hypotheses conjectured that the current study would increase the reliability of the CAPS-r with the addition of the three items pertaining to alcohol and technology use.

Methods

Participants. Participants in this study were Ball State University students between the ages of 18-25. Participants were recruited via Ball State Communication Services. I collected basic demographic information pertaining to age, ethnicity, gender, etc. about the participant, but did not require the participant's name or any other identifying information. Anonymity is a priority in this study due to stigma around alcohol misuse, abuse, and dependence.

Materials. Materials for this study include the College Alcohol Problems Scale (CAPS) (O’ Hare, 1997) which tests college-age students for issues in their behavior with alcohol that may not reach clinical scales, otherwise identified in this study as risky drinking. This scale was formed by Dr. Thomas O’Hare, an experienced mental health and substance abuse clinician. Dr. O’Hare examined main factors of problematic drinking and determined 20 items under the general categories of consequences. These categories included physiological, emotional, interpersonal, and community problems (O’Hare, 1997). With the review of colleagues, the 20 items were simplified down to 10 items and the subscales of this measure were determined to be Socio-Emotional and Community. Participants score these items on a range of 1 (meaning never happened) to 6 (meaning happened 10 or more times) based on their experience in the past year. After being reformed in 1997, the CAPS-r consists of 8 items that ask participants to respond on the 1-6 scale rating how often they have experienced the problem described in the item within the past year.

Overall, psychometrics reveal strong validity in the original CAPS-r scale by Dr. O’Hare when compared to other frequently used scales such as MAST and the Quantity-Frequency Index which have both been used in literature as reliable measures for alcohol use (O’Hare, 1997). Items on this measure are simply listed with instructions to “Use the scale below to rate HOW OFTEN you have had any of the following problems over the past year as a result of drinking alcoholic beverages.” (O’Hare). An example of an item measuring depression symptoms due to drinking is, “Feeling sad, blue, or depressed” (O’Hare, 1997). The participant then rates how often they have felt these negative effects in the past year on the 1 (never)-6 (10 or more times) scale. For the current study, this simplifies the writing of new items for the scale due to the simplicity of the items. Added items will consist of, “Posted regretted content on social media”,

“Inappropriate/regretted calls made to another person”, and “Inappropriate/regretted texts sent to another person”.

The MAST scale followed the CAPS-r measure with the additional three items. As stated in the literature review, this scale measures for all three levels of alcohol related difficulties observed in this study (alcohol dependence, abuse, and risky drinking). This measure consists of 24 items concerning thoughts, feelings, and behaviors related to alcohol consumption. Participants responded “yes” or “no” to items then responded about their history with arrests due to alcohol consumption. Points are totaled by attributing points for every “yes” response then adding points for any arrests due to consumption.

Procedure

The CAPS-r measure with the additional items of the current study was administered to participants after collecting demographic information. Following the CAPS-r with additional items, data from the MAST measure was also be collected. All measures were distributed via Qualtrics survey and results were kept in a password protected computer and database. After data collection, internal and external validity of the additional items were evaluated in their consistency with the overall results of the usual scale as well as against the MAST measure. The current study aimed to assess the use of the additional items validity within the scale and check the concurrent or external validity against another clinical scale. By doing this, the current study provided insight to whether the use of issues with alcohol and technology to help determine problematic drinking behavior in this kind of assessment for risky drinking.

Results

Preliminary Results

Descriptive statistics showed this sample of undergraduate college students ($n=290$) was mostly female (female= 71.7%, male= 28.3%). This sample consisted of mainly White participants ($n=267$, 92%) with small numbers of Black ($n=9$, .03%), Hispanic ($n=9$, .03%), Asian ($n=2$, .007%), and Multiracial ($n=2$, .007%) participants. Demographic data showed that most students took a recommended amount of credit hours (15 hours per semester) and less lived on campus ($n= 110$, 31.9%) as opposed to off campus ($n= 180$, 62.1%). There were also a high number of students in this sample involved in at least one social organization which could include fraternities and sororities ($n = 279$, 96.2%). Participants also had similar high involvement in at least one academic extracurricular activity ($n=269$, 92.8%) and athletic extracurricular activities ($n=269$, 92.8%).

Results for the CAPS-r with Added Items, Original CAPS-r , as well as the MAST measurement were positively skewed. Most scores fell under the cut-off score for Risky Drinking on the MAST measurement which was determined by previous studies on the MAST (Selzer, 1968). Table 1 highlights the distribution of means, medians, standard deviations, and ranges on the CAPS-r with added items, Original CAPS-r, and MAST in this sample. For the MAST, Risky Drinking was defined as a score of 4 or higher (Selzer, 1968). In this sample for the MAST ($M= 3.00$, $SD= 6.79$), the maximum score was a 57 indicating severe alcohol dependency while the minimum was 0 indicating no alcohol use at all.

The CAPS-r without added items ($M= 15.15$, $SD= 7.57$) indicated a maximum total score of 48.00 and a minimum of 8.00. The cutoff for Risky Drinking previously was 4.45 on items 1-5 and 6.77 on items 6-8. Using these cutoff scores to create a composite cutoff indicates a cutoff

score of 11.22 for the original items. In both of these scales, most students fell slightly below the cutoff score for Risky Drinking. These means, medians, standard deviations, and ranges are described below in Table 1.

In addition to these conclusions, the data showed a reduced number of missing responses as shown in Table 1. Even with counterbalancing, participants left fewer missing responses on the CAPS-r with Added Items (missing= 8, .25%) than the MAST (missing= 127, 1.82%) as seen in Table 1.

Table 1

		Measurement Statistics		
		CAPS-r with Added Items	Original CAPS-r	MAST
N=	Valid	282	265	163
	Missing	8	25	127
Mean		22.0267	15.1547	4.4908
Median		19.4182	13.0000	3.0000
Std. Deviation		10.71949	7.57454	6.78721
Skewness		1.607	1.528	4.481
Range		60.00	40.00	57.00
Minimum		12.00	8.00	.00
Maximum		72.00	48.00	57.00

Hypothesis Testing

The first hypothesis being tested predicted that extra items on the CAPS-r would not cause a significant decrease in internal reliability when compared to other items in the scale. Risky drinking behaviors related to technology were included in the new scale, increasing the scope of the scale to all kinds of modern behavior and communication while intoxicated. Internal validity was tested by conducted Cronbach's alpha. The second hypothesis predicted that the

correlation between the MAST and original CAPS-r would be significantly less than the MAST and the CAPS-r with three additional items.

To test the first hypothesis, correlations of single items in relation to other items on the scale were analyzed to determine if the new items correlated with the original CAPS-r measurement using a Reliability Analysis. This test determined whether or not the new items measured the same construct as the original 8 item CAPS-r measurement. This analysis revealed a maximum correlation of $r = .665$ and a minimum correlation of $r = .248$. Alpha for the original CAPS-r scale was $\alpha = .749$ for the CAPS-r was $\alpha = .870$. This showed an increase in the internal consistency between items, confirming the hypothesis.

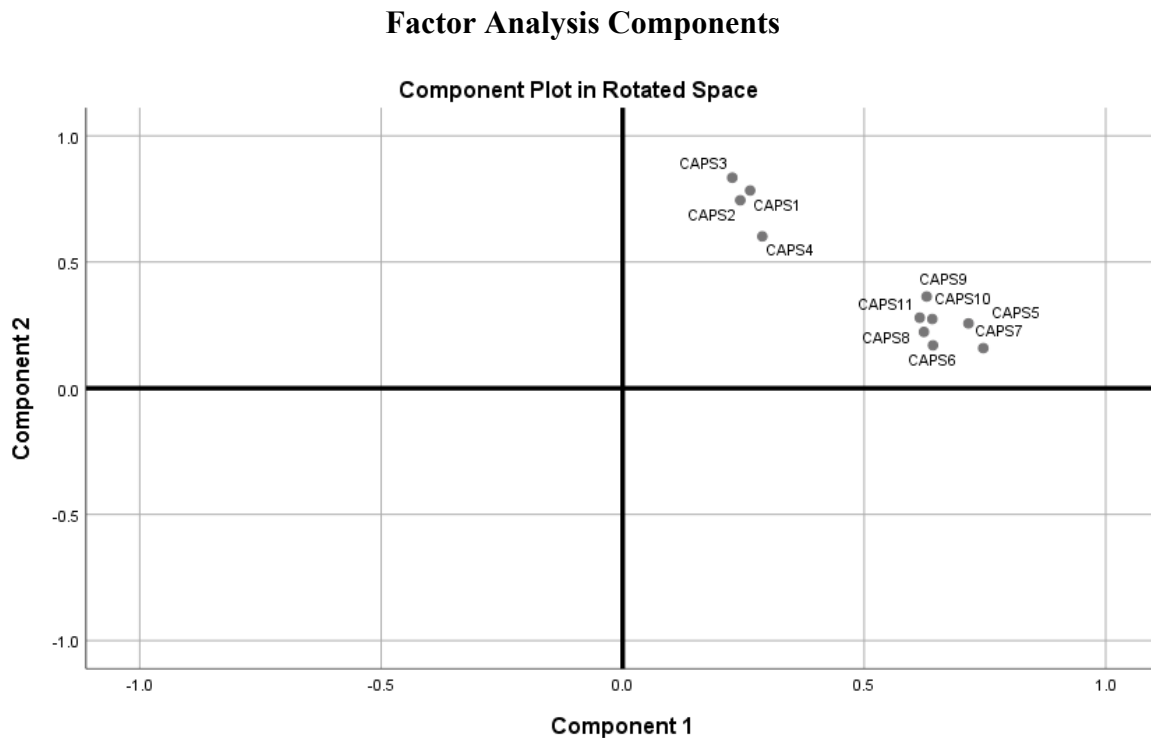
For the second hypothesis, correlations between original CAPS-r and the MAST were compared to the CAPS-r with added items and the MAST were computed. This test would determine if the additional items measured Risky Drinking in the same way other scales measure Risky Drinking. When the original CAPS-r scale and the MAST were compared correlations were strong between scores on both scales $r = .790$.

Exploratory Analysis

While analyzing the data, factors that became relevant to data interpretation included sex and components of the scale found in factors analyses. When comparing males to females, males had consistently higher scores on the MAST ($M = 7.79$, $SD = 10.52$) than females ($M = 3.11$, $SD = 3.65$). This was also true for the CAPS-r without added items for males ($M = 16.66$, $SD = 8.72$) when compared to females ($M = 14.55$, $SD = 7.00$) as well as males tested on the CAPS-r with added items ($M = 23.64$, $SD = 11.71$) when compared to females on the same measure ($M = 21.63$, $SD = 10.24$). All of the maximum scores for the MAST, original CAPS-r, and CAPS-r with added items came from male participants.

When considering sex in this study, males scored higher than females on the original 8-item CAPS-r measurement, the CAPS-r with added items relating to technology, and the MAST. An independent samples t-test was conducted to measure the difference between males and females on all three measurements. Males that responded on the MAST ($M= 7.79$) scored significantly higher than females on the same measure ($M=3.11$) $t(161)= 3.006, p< .001$. Males also scored slightly higher on the original 8-item CAPS-r measurement ($M= 16.66$) than females ($M= 14.55$) $t(263)=2.06, p< .05$. Although males scored higher on the CAPS-r with added items pertaining to technology use while intoxicated ($M= 23.64$) than females on the same measure ($M=21.36$) it was not a statistically significant difference $t(280)= 1.54, p> .05$.

A Principal Components Factor Analysis was conducted on the 11 CAPS-r items which included the three added items. Varimax rotation was also used. Two factors emerged with Eigen values greater than 1, together the two factors explained 54.55% of the variance. This factor analysis supported the sub-scale structure of the original CAPS-r. One sub-scale measured Socio-Emotional Problems which included items 1-4. The other factor measured Community Problems which included items 5-8. A factor analysis on the CAPS-r with added items revealed the new items measuring interactions with technology while intoxicated correlate with items on the Community Problems sub-scale. The factor analysis showed correlations between items measuring texting while intoxicated. As shown in Figure 2, CAPS1 through CAPS4 cluster in one component which we identified as the Socio-Emotional Problems sub-scale while CAPS5 through CAPS11 cluster into another component which we identified as the Community Problems Scale.

Figure 2

Discussion

The purpose of this study was to examine the effects of adding three items to the CAPS-r measurement (O'Hare, 1997). The goals were to create an assessment that could be self-administered and scored, quick to take, and easy to understand for professionals and their clients. Prior studies revealed several measures of alcohol problems, but none that fit the criteria for the scale the current study. Scales lacked research based in college populations, self-scoring and administration capabilities, and brief scales that prevent missing data points (Devos-Comby & Lange, 2008).

After analyzing the data collected in the current study, conclusions that can be drawn about the updated scale are the validity of the scale, application in therapy settings for the client and the professional, as well as the ease of use for college campuses. The main findings included the internal consistency of the scale with added items, as well as the factor analysis which

revealed consistency in the factor structure between the original and the revised scale. Although the second hypothesis was not supported, arguments could be made for why those results show lower external reliability.

Internal Consistency. The internal consistency was good in this study, indicating that assesses communication with others via technology give a broader picture of how to test for Risky Drinking. Risky Drinking was defined by Devos-Comby & Lange (2008) as non-clinical yet problematic alcohol use. These items extend the scope of communication from the people immediately around the person to the people in their social network as well. Future studies could extend the research into the correlations between these added items in order to explore if they could be combined into one singular item to test texting, calling, and posting on social media at the same time with one concise item.

Sex Differences. In the current study, 200 participants identified as biologically female, 82 identified as biologically male, and 8 chose to not respond to the question. There was a very strong statistical difference between the means of males and females on the MAST measurement, and a slightly significant difference between the means of men and women on the original 8-item CAPS-r. However, on the current study's 11-item CAPS-r with items relating to technology use while intoxicated, there was not a statistical difference between the means of men and women's scores. This similarity in scores on the CAPS-r with added items could be evidence that men and women use technology while intoxicated in very similar ways.

The sample collected in the current study includes undergraduate students typically between the ages of 18-23 that have been grown up using technology in similar ways. The lack of a difference between means could be evidence that males and females have learned to communicate with technology similarly. For example, many children in the generation sampled

began using technology around the same time, have similar smart phones devices, and use technology based on common learned communication behaviors. Future research could include gender differences based on generation to determine if there is less of a difference in means between men and women when items about technology are added to the CAPS-r measurement across age groups.

Factor Analysis. Factor Analyses revealed two main components in the CAPS-r which were identified in prior research as the Community Problems and Socio-Emotional Problems subscales. The added items about use of technology for communication while intoxicated all loaded on the Community Problems subscale. This is most likely because social media, texting, and calling platforms are modern extensions of community interactions. This exploratory analysis was conducted to see if the items would create their own component or blend in with what the scale was originally testing after seeing an increase in the alpha score for the CAPS-r. While these items test similar ideas to the items already included in the Community Problems scale, we can now make assumptions based on all forms of communication with a person's community, not just the in-person interactions.

External Validity. In the current study, a second hypothesis was proposed that predicted the external validity would stay consistent and raise in similarities in answers. While this correlation did not occur, arguments about the analysis style's effects could be raised. The MAST has been shown in research to address Risky Drinking, but is not necessarily the gold standard of testing. There are many different assessments that could be used to analyze the external validity of the CAPS-r that have been reviewed previously such as the AUDIT , SASSI, CAGE, Svanum's Scale, RAPI, and YAAPST. Further testing should explore the external validity of the CAPS-r with added items about using technology while intoxicated in relation to

scales that measure for both clinical and non-clinical levels of problematic drinking. These analyses could reveal the ability of the CAPS-r with added items to measure clinical levels of drinking as well as non-clinical Risky Drinking.

Implications

The implications of an accessible scale for college students are significant. Students, professionals, and researchers can benefit from accessible assessment for Risky Drinking such as the CAPS-r with added items examined in the current study. Online anonymous resources provide a foot-in-the-door opportunity for students to self-assess their own behavior without having the anxieties of talking face to face with a professional who is a stranger. After self-assessing, the student then has a platform for seeking resources in a college counseling center. Intake sessions could be based around the test, giving students a tool to talk about their problematic behavior as a result of alcohol consumption even if it does not reach clinical levels. The CAPS-r with added items in the current study is not meant to be a clinical tool, but rather a preventative measure to increase treatment of college students before they develop alcohol abuse or alcohol dependency which requires clinical treatment. Since alcohol problems are prevalent during this time (Johnston, O'Malley, Bachman, Schulenberg, & Patrick, 2013), scales like the CAPS-r with added items in the current study could prove useful.

In addition to benefits to the student's ability to self-assess and base their experience around a measurement tool, there are benefits to the mental health professional resources as well. The CAPS-r contains two scales, Community Problems and Socio-Emotional Problems. While the professional might not know the student well, they can use the CAPS-r data to create a picture of where issues are stemming from. If a student has issues pertaining to their interactions with the community around them, the professional can start closer to the issue by assessing their

internal thoughts and feelings based on their responses on the Socio-Emotional Problems subscale. This is important in the college counseling setting because of the short amount of time professionals have with students. The CAPS-r with added items in the current study could be used as a tool in treatment of college students in a therapy setting.

Research with college students often results in loss of data because of extensive measures that consume too much of students' time. Students lose interest or do not have time to take long measures which causes missing data points. In this study, the MAST measure which contains over 20 items had a total of 127 missing data points over the 290 participants' answers to the 24-item scale resulting in 1.82% of data missing. In contrast, the CAPS-r with added items contained only 11 items and brought the number of missing data points down to 8 missing data points or .25% of data collected. Even with counterbalancing in effect which randomized the order of scales presented, students were more likely to respond to a scale that took around 5 minutes as opposed to a lengthy scale that took more time. Simple scales could help researchers collect data that represents different types of behavior without losing data points. This could lead to more effective data analysis by preventing assumptions of scores for those missing data points.

Current Study Limitations

Limitations of this study include the participant sample and testing procedure. The sample collected included 71.7% female, leaving only 28.3% of males represented by this study. This may have prevented the results from representing all of the students on a college campus. A more even sample of sex may show higher levels of drinking since males scored significantly higher than females on both measures and should be assessed in future studies. In addition to this limitation, the MAST was used as a gold standard of assessment for Risky Drinking in college

students. While it is a verified and frequently used measure, further research on the CAPS-r with added items pertaining to technology use and alcohol should repeat this analysis using other measures.

Future Research

This study could benefit from further research comparing the CAPS-r with added items to other scales and with more equal participant pools to confirm the results. In addition to this, the sex and gender differences should be further analyzed to determine why there are less differences between men and women on the CAPS-r with technology related items. Overall, the CAPS-r with added items is could provide an opportunity to create accessible preventative assessment for college students with further investigations.

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Appendices

Appendix A

Measures

CAPS-r Scale

*Use the scale below to rate **HOW OFTEN** you have had any of the following problems over the past year as a result of drinking alcoholic beverages.*

1. Feeling sad, blue, or depressed

- (1) Never (2) Yes, but not in the past year (3) 1-2 times
(4) 3-5 times (5) 6-9 times (6) 10 or more times

2. Nervousness, irritability

- (1) Never (2) Yes, but not in the past year (3) 1-2 times
(4) 3-5 times (5) 6-9 times (6) 10 or more times

3. Caused you to feel bad about yourself

- (1) Never (2) Yes, but not in the past year (3) 1-2 times
(4) 3-5 times (5) 6-9 times (6) 10 or more times

4. Problems with appetite or sleeping

- (1) Never (2) Yes, but not in the past year (3) 1-2 times
(4) 3-5 times (5) 6-9 times (6) 10 or more times

5. Engaged in unplanned sexual activity

- (1) Never (2) Yes, but not in the past year (3) 1-2 times
(4) 3-5 times (5) 6-9 times (6) 10 or more times

6. Drove under the influence

- (1) Never (2) Yes, but not in the past year (3) 1-2 times
(4) 3-5 times (5) 6-9 times (6) 10 or more times

7. Did not use protection when engaging in sex

- (1) Never (2) Yes, but not in the past year (3) 1-2 times
(4) 3-5 times (5) 6-9 times (6) 10 or more times

8. Illegal activities associated with drug use

- (1) Never (2) Yes, but not in the past year (3) 1-2 times
(4) 3-5 times (5) 6-9 times (6) 10 or more times

MAST Scale



NATIONAL COUNCIL ON ALCOHOLISM AND DRUG DEPENDENCE
OF THE SAN FERNANDO VALLEY

6640 Van Nuys Blvd., Suite C
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www.ncadd-sfv.org

Michigan Alcohol Screening Test

NOTE: This test can be [downloaded](#) in PDF format, but [Adobe Acrobat](#) is required.

The MAST Test is a simple, self scoring test that helps assess if you have a drinking problem. Please answer YES or NO to the following questions:

MICHIGAN ALCOHOLISM SCREENING TEST (MAST)

	YES	NO	Points
0. Do you enjoy drinking now and then?	<input type="checkbox"/>	<input type="checkbox"/>	
* 1. Do you feel you are a normal drinker? ("normal" - drink as much or less than most other people)	<input type="checkbox"/>	<input type="checkbox"/>	(2)
2. Have you ever awakened the morning after some drinking the night before and found that you could not remember a part of the evening?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
3. Does your wife, husband, a parent, or other near relative ever worry or complain about your drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(1)
* 4. Can you stop drinking without a struggle after one or two drinks?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
5. Do you ever feel guilty about your drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(1)
* 6. Do friends or relatives think you are a normal drinker?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
* 7. Are you able to stop drinking when you want to?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
8. Have you ever attended a meeting of Alcoholics Anonymous (AA)?	<input type="checkbox"/>	<input type="checkbox"/>	(5)
9. Have you gotten into physical fights when drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(1)
10. Has your drinking ever created problems between you and your wife, husband, a parent, or other relative?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
11. Has your wife, husband (or other family members) ever gone to anyone for help about your drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
12. Have you ever lost friends because of your drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
13. Have you ever gotten into trouble at work or school because of drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
14. Have you ever lost a job because of drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
15. Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
16. Do you drink before noon fairly often?	<input type="checkbox"/>	<input type="checkbox"/>	(1)
17. Have you ever been told you have liver trouble? Cirrhosis?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
** 18. After heavy drinking have you ever had Delirium Tremens (D.T.s) or severe shaking, or heard voices, or seen things that are really not there?	<input type="checkbox"/>	<input type="checkbox"/>	(2)
19. Have you ever gone to anyone for help about your drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(5)
20. Have you ever been in a hospital because of drinking?	<input type="checkbox"/>	<input type="checkbox"/>	(5)

21. Have you ever been a patient in a psychiatric hospital or on a psychiatric ward of a general hospital where drinking was part of the problem that resulted in hospitalization? ☐ ☐ (2)
22. Have you ever been seen at a psychiatric or mental health clinic or gone to any doctor, social worker, or clergyman for help with any emotional problem, where drinking was part of the problem? ☐ ☐ (2)
- *** 23. Have you ever been arrested for drunk driving, driving while intoxicated, or driving under the influence of alcoholic beverages? (If YES, How many times? ☐) ☐ ☐ (2)
- *** 24. Have you ever been arrested, or taken into custody even for a few hours, because of other drunk behavior? (If YES, How many times? ☐) ☐ ☐ (2)
- * Alcoholic response is negative
- ** 5 points for Delirium Tremens
- *** 2 points for each arrest

SCORING

Add up the points for every question you answered with YES, for Q23 and Q24 multiply the number of times by points

- 0 - 3 No apparent problem
- 4 Early or middle problem drinker
- 5 or more Problem drinker (Alcoholic)

Programs using the above scoring system find it very sensitive at the five point level and it tends to find more people alcoholic than anticipated. However, it is a screening test and should be sensitive at its lower levels.

Appendix B**IRB Documentation**

Office of Research Integrity
 Institutional Review Board (IRB)
 2000 University Avenue
 Muncie, IN 47306-0155
 Phone: 765-285-5070

DATE: January 17, 2019

TO: Julia Bollwitt, BA (college senior)

FROM: Ball State University IRB

RE: IRB protocol # 1332942-1

TITLE: Assessing Risky Drinking in College Students

SUBMISSION TYPE: New Project

ACTION: APPROVED

DECISION DATE: January 17, 2019

REVIEW TYPE: **EXEMPT**

The Institutional Review Board reviewed your protocol on January 17, 2019 and has determined the procedures you have proposed are appropriate for exemption under the federal regulations. As such, there will be no further review of your protocol, and you are cleared to proceed with the procedures outlined in your protocol. As an exempt study, there is no requirement for continuing review. Your protocol will remain on file with the IRB as a matter of record.

Exempt Categories:

	Category 1: Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
X	Category 2: Research involving the use of educational test (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior
	Category 3: Research involving the use of educational test (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under category 2, if: (i) the human subjects are elected or appointed officials or candidates for public office; or (ii) Federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.
	Category 4: Research involving the collection of study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

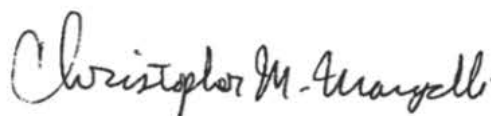
	Category 5: Research and demonstration projects which are conducted by or subject to the approval of Department or agency heads, and which are designed to study, evaluate or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in methods or levels of payment for benefits or services under these programs.
	Category 6: Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed which contains a food ingredient at or below the level and for a use found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

While your project does not require continuing review, it is the responsibility of the P.I. (and, if applicable, faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified or if problems related to human research participants arise in connection with this project. **Any procedural modifications must be evaluated by the IRB before being implemented, as some modifications may change the review status of this project.** Please contact (ORI Staff) if you are unsure whether your proposed modification requires review or have any questions. Proposed modifications should be addressed in writing and submitted electronically to the IRB (<http://www.bsu.edu/irb>) for review. Please reference the above IRB protocol number in any communication to the IRB regarding this project.

Reminder: Even though your study is exempt from the relevant federal regulations of the Common Rule (45 CFR 46, subpart A), you and your research team are not exempt from ethical research practices and should therefore employ all protections for your participants and their data which are appropriate to your project.



D. Clark Dickin, PhD/Chair
Institutional Review Board



Christopher Mangelli, JD, MS, MEd, CIP/
Director
Office of Research Integrity

Appendix C

Butler Undergraduate Research Conference

